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WORLD'S DAIRY CONGRESS.

Proceedings of the Veterinary Section.

Papers by Capt. Noel Pillers and Mr. Trevor Spencer.

For the first time in the history of the World's Dairy Congress, which held its eighth meeting from June 27th—July 12th, 1928, in London, a Veterinary Section was instituted this year. The Section was presided over by the then President of the Royal College of Veterinary Surgeons (Lieut.-Col. J. W. Brittlebank), while Captain W. L. Little was the Hon. Secretary.

In our issue of July 7th, we published a summary of the proceedings, and now give the papers presented to the Veterinary Section by Captain Pillers and Mr. Spencer, together with the report of the discussion upon these papers, as given in *The Scottish Farmer* of July 7th.

The Veterinarian in Relation to the Milk Supply.

By A. W. Noel Pillers, F.R.C.V.S., D.V.S.M., Deputy Veterinary Officer, City of Liverpool.

The title of the present paper has been chosen for me. In the preparation of it I have experienced some misgivings as to what exactly is expected of me, because at present in this country so few veterinarians are wholly and actively concerned with milk. On the other hand, the milk supply has many aspects which do not in the least concern the veterinary surgeon. Realising, however, that "Clean Milk," as we understand it to-day, is largely a question of healthy cows, of correctly constructed cow-sheds, and of aseptic methods, I have felt that my duties would be discharged in a satisfactory manner if I touched upon what the veterinarian does in some places, what he could do in others, and discuss some of the difficulties he experiences. During the last quarter of a century, public opinion in this country has made some slight progress with regard to milk hygiene, but the average requirements do not yet approach the standards which are known to be necessary. It may now, however, be stated with some degree of confidence that it is accepted that tuberculosis and certain other diseases in man are set up by drinking infected milk, but it must be realised that the British Isles consists of a number of states wherein the legislation is not uniform. In England and Wales there are two Acts of Parliament and three Orders devoted to milk, dairies and cows. It is therefore evident that it is admitted that some form of control of the milk supply is necessary and desirable. The passage of an Act or the issuing of an Order is of comparatively small moment when compared with the appointment of an able, tactful and conscientious official to see that the provisions of such legislative measures are strictly observed. Whilst it is said, and rightly so, that public health legislation in this country moves with public opinion, it must not be forgotten that a large proportion of the community look to those in authority to safeguard their many interests. This seems inevitable with the march of civilisation, which at the slightest provocation appears to want to set up a Ministry to look after each and every important phase of our activities. Within the last few years, our professional journals have devoted considerable space to the bovine udder in disease, to milk, and to legislation relating to cows, cow-sheds and milk. Each year sees more attention paid to these subjects in the graduate courses of our schools, and in the syllabuses for our post graduate diplomas. It is safe to say that by his training in all that pertains to bovine anatomy, physiology, dietetics, chemistry, pathology and bacteriology, and from his knowledge of zoo-technics, of the construction of animal habitations, and of sanitary law, the veterinarian is able to offer excellent service to the community in whatever position he finds himself with regard to the milk supply.

Throughout this paper little reference will be made to the general practitioner as such, because his activities seem somewhat remote from the milk supply question. Nevertheless, it must be realised that his work is of considerable importance, because he is so often consulted, by the farmer, when questions concerning milk arise. The cow, regarded as a milk-producing machine, needs his attention when secretion is lessened, or fatal illness threatens. In the control of infective conditions of young stock, or contagious disease, such as abortion, his activities are of great value. Where sanitation and feeding are at fault he is able to correct. He advises the owner when any of his stock is suffering from affections which render the milk unfit for food. He must therefore be well informed on the law and on drugs, poisons and diseases affecting milk.

In his capacity as a municipal or county officer, the various activities of the veterinary surgeon are definitely correlated. In the routine inspection of dairy cows he is brought into contact with the control of scheduled contagious disease, the construction of cow-sheds, etc., and as an inspector of meat in the abattoir he encounters both contagious disease and the ordinary diseases of cattle that have been milk producers. The employment of the veterinarian in any of these spheres must reflect favourably on the public health. A perusal of the vast literature referred to above leads one to believe that the experienced public health veterinarian of to-day would formulate three standards for milk consumed by the public, on the grounds of prevention of disease alone. Other additional conditions would, of course, become necessary where the question of quality was concerned.

1. Milk from inspected cows free from tuberculosis.
2. Milk from cows which have been subjected to regular routine veterinary inspection.
3. Milk pasteurised for such a time and at such a temperature as to kill pathogenic bacteria.

Although it is possible in each of the above cases for the human factor to fail, and as a result living tubercle bacilli

to be found in the milk, it is considered that a national milk supply on this basis would be a great advance. It is now proposed to discuss these kinds of milk under separate headings.

1. Milk from Inspected Cows Free from Tuberculosis.

For many years a number of private families have kept their own milk-producing animals and veterinary surgeons have recommended that such animals should pass the tuberculin test. This practice started soon after the introduction of tuberculin. Many dairymen have from time to time kept a few tuberculosis-free cows for special customers. Then came herds, in which the disease was kept out by means of the test, in order to prevent losses from tuberculosis rather than from a milk supply point of view; later many public committees such as those controlling hospitals and mental retreats kept up herds free from the disease. The difficulties in maintaining herds free from tuberculosis are considerable, even when all the stock is reared on the farm, but they are much greater when additions from outside are being constantly made. Many local authorities are now purchasing milk from tubercle-free cattle, for drinking purposes in hospitals, for infant welfare work, and for school children.

According to Forrester(1) the following table shows the progress which has been made in England and Wales with regard to herds licensed under the Milk (Special Designations) Order of 1923, to produce milk from cows which have passed the tuberculin test:—

Grade of Milk.	Year.			
	1924	1925	1926	1927
Certified	61	77	97	121
Grade A (Tuberculin Tested)	45	71	104	150
Totals ...	106	148	201	271

Although this represents an increase of 42, 53, and 70 herds respectively per annum it will take many years at this rate before the milk from non-tuberculous cows represents anything above a minute proportion of the public supply. Improvement will be proportional to the education of the consumer and producer concerning the advantages of such milk. Authoritative articles in the daily press have recently informed us that there are over 200 cities in the United States of America, whose bye-laws prescribe that all milk sold within their boundaries shall be from cows which have regularly passed the tuberculin test. *The North American Veterinarian* for November, 1927, states that the federal and state estimates for tuberculosis eradication in 1928 amount to 18 million dollars. Although the percentage of cattle affected with tuberculosis in most of our herds is high, it is likely that in time we shall see the introduction of a local Order defining the limits of a tuberculosis free area into which no bovine will be allowed until it has passed the tuberculin test. Such would be the first step, and would be followed by the addition of more territory. It appears to be accepted that animals which have been inoculated with certain types of a virulent tubercle bacilli for the purpose of bringing about immunity, for some time afterwards react to the tuberculin test. If this is so, and the method becomes common, and of proven value, then some process will have to be found whereby these animals can be admitted to the present "Certified" and "Grade A (Tuberculin Tested)" herds. It may be claimed for a high grade milk produced under proper conditions from healthy inspected cows which have passed the tuberculin test within six months that it is a genuine, natural, and safe article of the greatest possible dietetic value.

2. Milk from Cows which have been subjected to Regular Routine Veterinary Inspection.

Several large towns have for years subjected the milking cattle within their areas to regular veterinary inspection. The number of visits made to each herd during each year has varied somewhat owing to many causes, but it has often been from four to six times. Experience shows that the educational value of such visits to the cow-keeper is considerable, and if it is carried out within a few hours of milking, and combined with the microscopic examination of special samples, the chances of missing abnormalities of the udder are small. It is only by such examinations that many of the diseases which render milk unfit for use can be detected. The amount of milk produced within cities varies; some derive about one-third of their total supply from inside sources, but in the case of many others it is much less than this amount. In the case of milk coming from areas outside the boundary, it is the custom to take samples on arrival and submit them to bacteriological examination. The result is known in from four to six weeks, and if a sample is tuberculous the Medical Officer of Health of the producing district is notified under the Milk and Dairies (Consolidation) Act, 1915.

Prior to September, 1925, when this Act came into force, many towns had powers enabling their officers to go straight to such farms. The effect of the new procedure is often to increase the period of tuberculous milk supply, and the arranging of visits and delivery of notices gives time for evasions. The taking of bulk samples from country milk in towns has shown that it is often tuberculous. Brittlebank(2) states that during 1926 10·33 per cent. of farms sent in tuberculous milk. During the 26 years ending in that year the average was 9·48 per cent. per annum, with a minimum of 5·79 per cent. in 1909, and a maximum of 14·94 per cent. in 1920. He estimates that the minimum average period a country farm remains infective is about four months. Whilst the tuberculous bulk sample has been useful in drawing attention to the prevalence of infected milk, it is far from being an exact process. A positive sample may lead to the detection of a tuberculous udder, but on the other hand, though no cows may have been sold and none added to the herd, it may happen that the supply on the day of inspection will fail to produce inoculation tuberculosis. In such a case the explanation may be some fleeting and slight contamination, perhaps not involving the cattle at all.

A negative result does not, however, always mean that the supply tested is non-tuberculous, it is simply a negative finding. As all the tankards from one source cannot be tested, it is known that veterinary inspection has detected

a tuberculous udder, whose presence sampling did not indicate.

The positive result does not record the degree of contamination. The small number of samples taken by many towns indicates that very few of the herds supplying them are so examined, and even when all sources are sampled during the year, it is only done once or twice, when only one or two tankards are tapped out of a daily supply of many. A cow with an infected udder, if milked last, may only contaminate one churn—the last one. The amount of tuberculous milk sent out by a farm during the minimum average period of infectivity varies considerably. It is influenced by the size of the herd, the method of mixing the milk, and the position of the cow in the herd. The intensity of the contamination likewise varies; it may be high in a small herd containing a cow with an active tuberculous udder, or in the last milk of a large herd. On the other hand, there may be considerable dilution. The mixing of a tuberculous milk with that from several other farms at a depot may give rise to a large amount of contaminated milk, the actual source of which is rarely traced.

Routine veterinary inspection would do for country supplies what it does in towns; and that because many cities derive from two-thirds to nearly all their supplies from outside sources, it seems surprising that they have not insisted on the adoption of measures similar to those enforced in their own area. If the Health Committee of each borough deriving its milk from any one county were to point out forcibly and constantly to the county Health Committee the results of bulk sampling, some action would surely be taken.

It appears strange that county councils as a whole have not seen fit to take energetic steps to safeguard and purify a product which is of such economic importance to them. The Milk and Dairies Order of 1926 gave them power to carry out inspection of cattle, for it provided that "every county council and county borough shall cause to be made such inspection of cattle as may be necessary and proper for the purposes of the Act and of this Order." It is now a matter of history that the Ministry of Health soon afterwards issued a circular letter, with the result that the only inspection now carried out is when a "consuming" authority reports that a tuberculous supply was received some weeks previously. The West Riding of York with a bovine population of 267,546, has now five veterinary officers; the North Riding, with 189,091 cattle, has three; Surrey, with 44,486 bovines, has four; and Cumberland has two for 161,812 cattle. Certain other counties have one veterinary officer, and some are contemplating the appointment of such officials. The great milk-producing counties of Cheshire, Lancashire and Staffordshire do not appear to have taken any very active steps in this direction. It seems to the writer that the prevention of milk-borne human disease in towns is a matter of some importance to the county health authorities, because the county inhabitants often take some of the same milk and because many people spend so much of their time in county and town. This aspect is gradually forcing itself upon the attention of the county administrators. Dr. A. G. R. Foulerton[3] M.O.H. for East Sussex has already published the figures of six local authorities deriving milk from that county. Of 293 samples, 21 were tuberculous, and he advocates thorough veterinary inspection in the interests of public health and the farmer. J. W. Hall Masseter[4] gives an account of the examination of all cows in milk or in calf in the county of Gloucestershire by sixteen veterinary surgeons. 52,131 animals were examined, and of these 39,706 were in milk, 248 were slaughtered under the Tuberculosis Order, 292 cases of suppuration of the udder, and 78 cases of either actinomycosis, any comatose condition, and any septic condition of the uterus, etc., etc., were discovered. The county of Lanark offers an interesting example of what can be achieved by years of veterinary inspection. The work for the last quarter of a century will always be associated with the name of the distinguished veterinary adviser to the county, Mr. Hugh Begg, F.R.C.V.S. In 1926, the bovine population was 69,906, of these 34,632 milking cows were examined: 70 were found to have tuberculosis of the udder, 77 tuberculous emaciation, and 149 had chronic cough with tuberculosis. A total of 296 animals was thus slaughtered under the Tuberculosis Order. That constant contact with progressive veterinary opinion has been of the greatest educational value is shown by the number of graded herds in the county. There is likewise evidence that similar results would be obtained in other areas when one remembers the progress of the graded milk movement in the neighbourhood of the enthusiastic National Institute for Research in Dairying at Reading.

Lanark has now 37 tubercle-free herds [17 Certified and 20 Grade A (Tuberculin tested)] numbering 1,100 cows, producing from 450 to 1,400 gallons of milk per cow per annum. There are also several tubercle-free herds upon premises, whose buildings are not yet suitable for licensing. It is estimated that between 40 and 50 herds are in the process of being rendered free from tuberculosis by means of the tuberculin test.

With regular routine veterinary inspection would go attention to cow-sheds and methods of handling milk, so that such a campaign should result in the production of an article closely approximating the present Grade A standard. According to Forrester (*loc. cit.*), the number of such licensed herds in England and Wales has gradually increased during the last four years, thus:—1924, 51; 1925, 110; 1926, 203; and 1927, 266. It is freely stated that many dairies and herds which have been subjected to inspection during the last few years are producing milk equivalent to this standard. Milk produced under conditions which have been outlined above would be a natural product of reasonable safety.

3. Milk Pasteurised for such a time and at such a Temperature as to Kill Pathogenic Bacteria.

Many medical advisers to local authorities have for years advocated pasteurisation of the milk supply. Pasteurisation however, without exact definition and control has often failed in its object. Even to-day the consumer's liking for the cream line is an important factor in dictating the temperature which is used for uncontrolled processes. When a temperature of 145°F. is used, the householder is often disappointed with the physical nature of the milk. The policy of the Ministry of Health with regard to pasteurisation is expressed by Sir George Newman[5] thus:—"It is generally recognised that milk obtained from perfectly healthy cows under the cleanest conditions, cooled

immediately, and distributed with the least possible handling and delay, is the best that can be procured. The difficulty in existing circumstances, however, of securing such ideal conditions for milk production inevitably restricts its supply. In a highly urbanised country, such as England, transport and distribution complicate the problem of a satisfactory milk supply, and in order that an adequate, safe and cheap supply of milk should be readily available for everyone it is necessary to have resource to pasteurisation, which has already proved so valuable in the milk supply for cities in the United States of America."

Later on in the same work (p. 17) it is stated that the nutritive qualities of milk in conformity with its physical and chemical characters do not appear to undergo any appreciable change as a result of pasteurisation, except in respect of antiscorbutic properties. These properties, we know, are the greatest possible value in helping to protect the body against microbic invasion. They can, of course, be supplied from other sources, but it is freely stated that more disease results from the lack of drinking raw milk than is produced by infected milk. The direction in which some municipal authorities are heading is expressed in the following extract from Brittlebank (*loc. cit.*):—

"The general recognition of these facts—for the production of graded milk, is so infinitesimal a portion of the whole supply—makes it imperative for large centres of population to develop as rapidly as possible some further line of protection for its populace, and I am convinced that only in pasteurisation as legally defined in the Milk (Special Designations) Order of 1923, we have an effective and satisfactory expedient for dealing with the position at the present time. In this direction great progress has been made during the year; thirteen firms now hold pasteurisation licences, and so deal with all their ordinary milk. Excellent dairies have been built, equipped with high efficiency, modern machinery producing milk for distribution of a very high quality and safe to the consumers.

Samples of mixed milk from all these licensed pasteurisers' premises are submitted and taken every fortnight, and in no case since the inception has any one of these samples of pasteurised milk been found to cause tuberculosis in inoculated animals."

It is well to interpolate here that it is fairly common to find that milk which has been pasteurised by methods not conforming to the legal standard is capable of producing tuberculosis. Dr. A. Stanley Griffith(6) has given an account of the dangers to human beings as a result of infection with bovine tuberculosis, and advocates pasteurisation and tuberculosis-free herds.

Forrester (*loc. cit.*) states that the number of licensed pasteurisation premises has increased as follows:—

1924	...	43
1925	...	64
1926	...	80
1927	...	120

Milk properly pasteurised is safe, and often keeps well, and although this is a great thing to be able to say, it is practically all that can be claimed for it. An invitation to partake of a glass of pasteurised milk rarely generates a feeling of enthusiastic anticipation.

During recent years there has been a great increase in the consumption of preserved, tinned, condensed and dried milks. Manufacturers have left no stone unturned in catering for every public desire. In infant welfare work some towns have purchased over twenty-five tons of dried milk per annum.

The veterinarian must agree that a safe milk supply is essential, but he feels strongly that the greatest effort should be made to produce an article pure from its very source, rather than subject infected milk to a curing process to render it safe. Pasteurisation is the very antithesis to "Clean Milk," as we understand it to-day.

It will be seen that the above three classes of milk, viz.:—1, from tuberculin tested cows; 2, from inspected cattle; and 3, pasteurised milk, with other conditions, would agree closely with the primary divisions of milks under the Milk (Special Designations) Order.

The confusion, however, which has arisen on account of the meaningless names used in this Order, has been considerable.

This is a matter of regret, because consumers and many advisers not directly in touch with the subject, often think they are dealing with the highest grade when in reality they are concerned with a much lower one. The public cannot be blamed for regarding Grade A as the best. The names should either be in simple descriptive words, or in a series. An important step in improved milk distribution would be the adoption of a sealed container for household and similar deliveries. This concerns the veterinarian, because it lessens the chances of some contaminations which are at times wrongly attributed to the cow. There appears to be little to lose and much to gain by placing all milk for human consumption in a sterilised vessel at the earliest possible moment after milking and cooling. The correct labelling of milk is likewise a matter of importance to the producer, consumer and official. It would appear that at present large quantities of pasteurised milk are sold as the ordinary product. Safe though it be, and possessed of keeping powers, the consumer ought in all fairness to know that his supply has been deprived of its antiscorbutic powers, that its cream line has been somewhat dissipated, and has, perhaps, had its keeping powers well tried before he receives it. If the temperature and time used in the process are not of the legal standard, it is likely, too, that the all-important factor of safety has not been obtained. A barrier to progress in a great number of instances is the question of dual control. With regard to the cow-shed and diseases of the cow, it ought to be sufficient for the medical officer to say what standard of milk he requires, and leave the rest to the veterinary surgeon. In many respects we are passing through the same process which the bacteriologist and analytical chemist had to, in order to establish their positions. Whilst tuberculosis might appear to have more or less monopolised what I have had to say up to the present, it must be remembered that it is this disease which has received the greatest publicity and has been the origin of most administrative action. On the other hand, many of the measures adopted against tuberculous infection of milk are of the greatest possible value in the prevention of other milk infections. The all importance of tuberculosis is seen in legislation. Under Section 5 of the Milk and Dairies (Consolidation) Act of 1915, there are penalties for knowingly selling or using the milk of any cow (1) which has given tuberculous milk; or (2) is suffering from

emaciation due to tuberculosis; or (3) is suffering from tuberculosis of the udder. The Tuberculosis Order of 1925 does not prohibit the sale of milk derived from cows suffering from the three reportable forms dealt with in the Order. It simply provides for the boiling, sterilisation, and non-mixing of it. As this would, in most cases, prevent its sale, one can add (4) chronic cough and showing definite clinical signs of tuberculosis, to the list. The Section of the Act quoted above also includes (5) acute inflammation of the udder, and the Second Schedule contains (6) acute mastitis, (7) actinomycosis of the udder, (8) anthrax, (9) foot-and-mouth disease, and (10) suppuration of the udder. The Milk and Dairies Order of 1926 adds (11) any comatose condition, (12) any septic condition of the uterus, and (13) any infection of the udder or teats, which is likely to convey disease. Such a list as this makes inspection a necessity if it is intended that the law shall be obeyed, because many of the conditions escape lay observation, and moreover, many veterinary surgeons see great difficulties in the definition of some of them. For example acute inflammation of the udder is mentioned in Section 5, and acute mastitis is included in the Second Schedule. Many of us regard these two terms as having the same meaning. In view of recent researches, and if actinomycosis is to be defined as being a disease due to *Actinomyces*, then certain clinical forms will be outside the law. Suppuration of the udder is likewise a term of the greatest possible elasticity, varying from a minute focus of pus to an involvement of the whole organ. There are other obscurities, but sufficient has been said to show how great are some of the difficulties encountered when one wishes to start an action to enforce some of the provisions of the law. It is somewhat strange that the certificate which one has to sign in the case of Grade A herds contains only five out of the thirteen conditions, which are included in the Acts and Orders referred to above. These are (1) tuberculosis of the udder; (2) tuberculosis in any form with emaciation; (3) chronic cough with definite symptoms of tuberculosis; (4) anthrax, and (5) foot-and-mouth disease. One fails to see why, if it is necessary to mention any, all are not included. On the other hand, indurated udder, enlargement of the supra-mammary lymphatic glands, mastitis, abscess of the udder, and retained placenta—not actually named in legal measures, are inserted.

In the case of Certified and Grade A (Tuberculin tested) herds the certificate contains the five additional conditions just given, and all the scheduled diseases with the exception of (1) giving tuberculous milk; (2) acute inflammation of the udder; and (3) acute mastitis. It may, however, be argued with some force that these are included in the terms tuberculosis of the udder and mastitis, so that in this case the diseases are provided for although not actually listed. Certain of the additional diseases mentioned in these certificates are not at all clearly defined by veterinary science; their very nature makes this almost impossible. Take, for instance, enlargement of the supra-mammary lymphatic glands, one often encounters cows with prominent glands without any history or evidence of disease, and it is difficult in such cases to say that they are pathological. Sufficient has been said to show the position which the veterinarian takes up with regard to the production of clean milk in this country, to point out some of the difficulties, and to emphasise that the producer should be helped, instructed and corrected without an overbearing amount of inspection. The use of the veterinary surgeon for this purpose must lead to improvement in the housing of cattle; to the advocation of fresh air; to segregation, isolation, and disinfection in the control of disease; to the employment of protective inoculation and to a high standard of general hygiene, by which means the producer and consumer must benefit.

It would be of considerable interest to us, if our colleagues from abroad would give us some information concerning the position of the veterinarian in relation to the milk supply in their countries.

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Discussion.

Mr. G. P. Male, Reading, opened the discussion. The work which had been done in his area had led to the great London dairy companies offering a higher price for improved milk. The point of the paper was to rebut the charge that their profession was not pulling its weight in this conflict. The difficulty was economic. It was said that the cost of grading milk in accordance with the designations made such a process impracticable. This was not in accordance with the facts in his experience. There had been an increase in price of 2.8 of a penny per gallon. Grade A was entirely misleading, as it was not from cows which need be tested at all. There were many anomalies in the Act 1925 which required to be removed. On the other hand, many local authorities had still to be educated in their duties under the Act now enforced. He had personally carried out many examinations, and he had never found more than one cow in a large herd giving milk containing tubercle bacilli. Inspection should be made compulsory, and not merely permissive.

Captain T. Howard Jones, County Veterinary Inspector, Glamorgan, said what was necessary was a stimulus to public opinion. There might be a danger of violently alarming the public mind. There was a tendency to give undue prominence to one disease—that of tuberculosis. Did their modern milk legislation bring them nearer to production of a milk supply free from disease germs? The answer was decidedly in the negative. There were only 271 registered free herds in England and Wales out of a total of somewhere about 350,000 herds. Such an infinitesimal proportion could account for nothing. Unless the average producer were offered some better incentive than he got at present, they would never see an improvement in the milk supply that would amount to anything. The general consuming public were entirely ignorant of the reasons underlying the legislation in force.

Captain Sidney Villar, Chief Veterinary Inspector, Middlesex, did not know one who presented himself as a specialist in this line. Such an one must have an intimate knowledge of dairy cows, such as is obtained by men who have spent their early youth on farms. Those who did

laboratory work had need to know how to deal with the clinician, and to learn from him the significance of clinical symptoms. The biological test was not often necessary in practice when there was this contact and understanding between those engaged in the work.

Professor OSTERTAG, the eminent German authority on meat inspection, addressed the meeting in his own language. His address was interpreted. He said there were two branches of the subject—Prevention and Control. Dealing with tuberculosis, both had to be brought into play. The control of that disease proceeded automatically. The objective was the prevention of the infection of human beings. The question had an economic aspect. Can we make this work pay? The veterinarian profession could do much in both directions, but it was not their duty to deal with the economic aspect.

Dr. SAVAGE, Medical Officer of Health, Somerset, said there were 6,000 milk producers in that one county. He was very anxious to get the co-operation of the veterinary profession in his administrative work. He had not yet been able to get a whole-time veterinary inspector appointed. Two years ago the question of making such an appointment was thrown out with scorn. The difficulty with him was that the appointment of a whole-time inspector was, under existing legislation, permissive and not obligatory. The great cry was for a more routine inspection of the milk supply. He would support that with certain reservations. In his opinion less than a quarterly inspection was not worth having. At present there was perhaps inspection twice a year, but in most cases it was once a year. He made out that the cost of a routine inspection by a whole-time officer would, at 1s. 6d. per cow, work out at £237,000, and at 2s. per cow at £316,000 per annum. These figures were based on the fact that the cow population of England and Wales was 3,163,000. Who was to meet that expenditure? The producer, who was the local ratepayer, asked why should he pay £10,000 or £12,000 per annum for the benefit of the urbanised buyer of his milk? By means of Treasury grants this could be made more of a national service. Assume all this expenditure to be incurred, the question arose, What would be the result? It would certainly reduce but it would not root out the disease. It would reduce the incidence of bovine tuberculosis. If they could show that routine inspection would reduce tuberculosis in cows the work should be made part of a larger scheme which would lead to the reduction of the disease in every form.

Professor PORCHER, France, addressed the meeting in his own language. In the matter of control of tuberculosis not much has as yet been done in France. Regulations cannot be supported right away. Public opinion has not yet been sufficiently educated. In 1924 certain general regulations were passed which applied to milk and tea. They had to take advantage of general laws regulating food stuffs in order to make some progress. These arrangements even were optional, not compulsory. Grade A and pasteurised grades were the furthest they had been able to reach so far. There has been no compulsory inspection of cowsheds. Proposals in that direction have rather scared cattle owners. In his view, monthly inspection would be best. He did not quite understand the distinctions made in diseases of the udder. He would have these regulations apply to all diseases of the udder. Control of milk should be enforced at all stages of manufacture, and it was important that it should begin at the cowshed.

Professor WOOLDRIDGE, Veterinary Adviser to the B.D.F.A., took up the points made by Dr. Savage. He was satisfied that a routine veterinary service would not cost anything like a quarter of a million. There would be very considerable saving in present-day remedial costs in the matter of sanatoria, and so on. If all pedigree herds were freed, the general health of the cattle population would be enormously improved. This would react favourably upon the human subject. It would react favourably on milk production, which would be enormously increased.

Mr. EATON JONES, Medical Officer of Health, Liverpool, spoke from the point of view of child welfare. One way of saving the children was to give them milk from tubercle-free cows.

"Do not let us pay all our attention to tuberculosis," said Major DUNKIN. "Twenty years ago Johne's disease was practically unknown; is there a dairy farmer to-day who can honestly say he has never had a waster from this disease? I am convinced this disease is on the increase and is the cause of steady loss to the farmer and diminution of milk yield."

Sir JOHN MOORE thought the eredication of bovine tuberculosis presented no greater difficulty than that which had existed when glanders was first dealt with. He thought it possible that proper methods would be equally successful in regard to tuberculosis.

The Detection, by means of the van den Bergh Reaction, of Incipient Liver-Necrosis due to Antimony Therapy.

By H. E. HORNBY, F.R.C.V.S.,
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During recent years the search for drugs combining high trypanocidal action with low toxicity has been continuous in several laboratories throughout the world, with encouraging results. Nevertheless, up to the present nothing has superseded tartar emetic, *i.e.*, sodium or potassium antimonyl-tartrate, in the treatment of the common forms of African bovine trypanosomiasis.

That treatment with this drug can yield valuable results is evident from numerous publications, *e.g.*, that of Curson (1926). On the other hand, I have shown in a recent article in this journal, that the great drawback to its use is the danger of acute liver necrosis (Hornby, 1928).

If, then, this form of antimony therapy was to be rendered safe, it seemed necessary to find a simple liver-function test which would reveal the effect on that organ of previous injections, and divulge with what safety the next could be given. It seemed possible that the *van den Bergh Test* of bile pigment in serum or plasma might fulfil these conditions; so I tried it on rabbits dosed experimentally with tartar emetic. The results have been sufficiently satisfactory to make me confident that the test can be used to control antimony therapy of the larger domesticated animals. Some months must elapse before the results of this application are made known, but meanwhile the description of experiments on rabbits may be helpful to sundry workers in the field of chemotherapy.

The animals used were initially healthy rabbits, weighing from 2½ to 3½ kilos, and were fed on a diet of oats, hay, cabbage and water. The tartar emetic used was pure potassium-antimonyl-tartrate, administered by injecting a 2 per cent. aqueous solution into an ear vein.

Toxic Dose of Tartar Emetic. The ordinary medicinal dose of tartar emetic for a Central African ox is one gramme, which is at the rate of about 0·005 gm. per kilo. It is by no means a safe dose, however, as when given to cachectic animals a small series of these injections has often proved fatal. To determine the dose which would be about as toxic for initially healthy rabbits as dosing at the rate of 0·005 gm. per kilo is for "flystruck" cattle, I gave different rabbits various amounts, ranging from doses at the rate of 0·005 gm. per kilo to those at the rate of 0·015 gm. per kilo, or even higher. When more than a

single injection were given, they were generally at two days' intervals.

At the rate of 0·005 gm. per kilo, tartar emetic was without ill effect on a rabbit which received a series of ten injections.

At the rate of 0·0075 gm. per kilo, a single injection appeared to be without ill effect, nor did the one rabbit which received a series of six injections appear to be any the worse for them.

At the rate of 0·01 gm. per kilo the results varied according to idiosyncracy. One rabbit received a series of six injections without harm, whereas another—which must be considered as extraordinarily susceptible—succumbed twenty hours after a single injection and, *post-mortem*, the liver showed the onset of necrosis affecting the whole parenchyma.

At the rates of 0·0125 and 0·015 gm. per kilo, results were similar, though with each rise of dose the proportion of animals showing no ill effects from a single injection becomes less.

It was noticed that whereas in cattle incomplete necrosis of the lobules is generally central, in rabbits it is peripheral. With this exception, one can say that for initially healthy rabbits doses at the rate of 0·01 gm. per kilo correspond closely in their effects with doses at the rate of 0·005 gm. per kilo given to "flystruck" cattle. Had my time not been strictly limited, I should have liked to keep to that dose, giving each of a number of rabbits a series of injections in the expectation that the livers of some, most, or even all, would sooner or later be affected, that their plasma would then react positively to the van den Bergh test, and permit observations leading to correlation of results of the test with liver lesions, and, in turn, the correlation of these lesions with breakdown of the organ's resistance to further dosing. As it was, I had to expedite results by commencing injections at the rate of 0·0075 or 0·01 gm. per kilo and, if these were well tolerated, increasing the rate until poisoning was effected. By this means I was able to produce various degrees of liver necrosis, and to correlate these to a certain extent with results of the van den Bergh test.

The van den Bergh Test. Dr. Hijmans van den Bergh found that if serum contained more than the normal trace of bile-pigment, then a colour change was *sometimes* produced on the addition of the diazo re-agent of Ehrlich, and *always* on the addition of the diazo re-agent plus alcohol.

Ehrlich's diazo re-agent:—

A.	Sulphuanilic acid	1 gm.
	Conc. HCl	15 c.c.
	Dist. water	1 litre.
B.	Sodium nitrite	0·5 gm.
	Dist. water	100 c.c.

Mix 25 c.c. of A with 0·75 c.c. of B when required for use.

Van den Bergh drew a distinction between the *direct* reaction taking place with the diazo re-agent alone, and the *indirect* reaction which requires the addition of alcohol. Speaking generally, the serum from a case of obstructive jaundice gives a prompt direct reaction as well as the indirect one, whereas serum from a case of hæmolytic jaundice gives the indirect reaction, but either a negative or delayed direct reaction. According to McNee, this difference is explained if we agree that bile-pigments are the product of reticulo-endothelial activity, and so formed to a considerable extent outside the liver, and that these pigments are altered by passage through the parenchyma cells. Thus in obstructive jaundice much of the bile-pigment present in the serum has passed through the hepatic cells and been returned to the circulation, and the pigment gives the prompt direct reaction. On the other hand, in hæmolytic jaundice the pigment has not passed through the liver cells and gives, in consequence, either a negative or a delayed direct reaction. Both kinds of pigment give the indirect reaction.

It is obvious that an immediate and direct result of necrosis of the parenchyma of the liver must be interference with the normal passage of bile-pigment through the bile canaliculi, and its consequent accumulation in the plasma, and in accordance with McNee's hypothesis such pigment should give either a negative or a delayed direct reaction. As a matter of fact, it gives a delayed direct reaction.

Attention may be called to the article by Davies and Dodds (1927) in which a strong case is made out for the supposition that the difference between the pigment giving both reactions and that giving only the indirect is merely one of oxidation, *i.e.*, whether bilirubin or biliverdin predominates; this pigment giving only the indirect reaction, whereas that one gives both.

Application of the Test. Many modifications of technique have been evolved since the test was introduced into clinical medicine in 1918; some of them for empirical reasons, since even to-day the action of all the re-agents used is not clearly understood. In the experiments here described I adopted Lepehne's modification of technique for the detection of the direct reaction, and Thannhauser and Andersen's modification for the indirect reaction as described by McNee and Keefer (1925).

Blood was drawn by means of an all-glass 2 c.c. syringe fitted with a sharp needle of 0·8 mm. external diameter. The interior of the needle and barrel of the syringe were moistened by drawing into and then expelling from them some 10 per cent. aqueous solution of potassium oxalate.

The tube to receive the blood was a small test tube of 8 c.c. capacity, which had been treated by putting into it 0·1 c.c. of 10 per cent. oxalate solution, then placing the tube on a hot gauze over a bunsen until evaporation had spattered the sides with dry powder.

The rabbit's ear was prepared by shaving, followed by gentle friction with cotton-wool moistened by xylol. The needle, attached to the closed, moist syringe, was inserted into a marginal vein against the blood flow, and the plunger slowly withdrawn right to the end, so that the barrel was filled with not less than 3 c.c. of blood. This was quickly transferred to the prepared test tube. The rabbit's ear was then sponged with alcohol to remove the irritant xylol.

To obtain plasma the oxalated blood was poured into a tapering centrifuge tube and spun at moderately high speed for ten minutes. Each 3 c.c. of blood yielded about 1·75 c.c. of plasma, of which 0·75 c.c. were required for the Direct van den Bergh test, and 0·75 c.c. for the Indirect van den Bergh test, leaving a little over for a Fouchet Test, to be described later.

The Direct van den Bergh Test. "0·25 c.c. of the oxalated plasma is placed in each of three small test tubes.

To tube I (the control) add 0·2 c.c. of water. Drop a small flake of caffeine-sodium-salicylate into tube III, shake to dissolve completely, and then add 0·2 c.c. of fresh diazo re-agent. In this tube a prompt or rapidly developing reaction may be obtained, quickly arriving at its maximum. Sometimes, in our experience, the effect of the drug is negative, but in any case ample time should be allowed for the colour reaction in tube III to be completed.

"To tube II then add 0·2 c.c. of fresh diazo re-agent, watching and timing the development of any prompt or biphasic reaction in comparison with the control tube I and the completed reaction in tube III." (McNee and Keefer.)

The Indirect van den Bergh Test. Into a centrifuge tube put 0·75 c.c. of oxalated plasma. Then add 0·4 c.c. of diazo re-agent and wait a minute or two to allow "coupling" to take place. Then add 1·75 c.c. of 95 per cent. alcohol and 0·75 c.c. of a saturated solution of ammonium sulphate. Mix, and then centrifugalise for five minutes. If the resultant clear supernatant fluid is at all pink it is transferred by pipette to the trough of a Hellige-Leitz colourimeter, and the depth of colour is matched with a standard wedge containing a solution made by dissolving 2·161 gm. of anhydrous cobaltous sulphate in 100 c.c. of distilled water. The reading on the scale opposite the wedge pointer is then noted, and consultation of a table supplied by the manufacturers of the colourimeter permits a quantitative estimation in "units" to be made. The *tone* of the colours of the trough and wedge may not match well, so comparison of the *depths* of tint of the two liquids introduces a small error due to the personal factor. However, readings made by the same observer are comparable. For the purpose of this research no importance was attached to the actual size of a "unit," although this probably approximates to the van den Bergh one of 0·5 gm. of bilirubin in 100 c.c. of plasma.

If the colour of the supernatant fluid is too intense, this must be diluted with alcohol two parts, water one part. If there is no trace of pink, then the test is negative.

The plasma of a normal rabbit is clear and, on the diet which these experimental ones were getting, almost colourless. It is completely negative to both the direct and indirect tests.

After an ordinary non-toxic dose of tartar emetic the rabbit appears entirely unaffected, and the plasma remains negative to the van den Bergh reactions.

The effects of a single toxic dose differ, of course, with the degree by which the margin of safety has been passed, as in the following examples:—

The effects of a single toxic, sub-lethal dose.

Rabbit A3. Female. Weight, 2·5 kilos.

18/4/28. Injected with 1·25 c.c. of 2 per cent. T.E.; *i.e.*, at the rate of 0·01 gm. per kilo.

19/4/28. Appears dull. Feeding, but not with good appetite.

20/4/28. Fairly bright, but appetite still poor. Fæces very dry.

Van den Bergh. Strong delayed direct. Very strong indirect of about 6 units.

21/4/28. Bright, and otherwise apparently normal.

Van den Bergh. Strong delayed direct, taking 5 minutes to complete. Good indirect of 3 units.

24/4/28. Bright, and normal in appearance and appetite. Plasma clear, dark yellow.

Van den Bergh. Faint delayed direct, taking 10 minutes. Faint indirect of less than 0·1 units.

Destroyed. Post-mortem examination revealed a healthy looking carcase. The *liver* weighed 92 gm., was somewhat pale and of firm consistence. Microscopically, the lobules appeared to be crowded with small, young, fat-free parenchyma cells, suggestive of recent injury and rapid regeneration.

The action on the liver of this single dose of T.E. appears to have been the immediate and fatal injury of a number of parenchyma cells; sufficient to provoke a strong van den Bergh reaction. This was followed by rapid and almost complete recovery during the next few days.

The effects of a single dose of ordinary size on a rabbit of extraordinary susceptibility.

Rabbit A6. Female. Weight, 3·5 kilos.

24/4/28. Injected with 1·75 c.c. of 2 per cent. of T.E., *i.e.*, at rate of 0·01 gm. per kilo.

25/4/28. *Died*, about 20 hours after the injection.

Van den Bergh Test of blood drawn *p.m.* from the heart; marked delayed direct. Distinct indirect of 1 unit.

The *liver* weighed 99 gm., was engorged, of uniform ochrous colour and friable. Microscopically there was already necrosis affecting the whole parenchyma, and sections fixed with osmic acid showed that the necrosis was preceded by fatty degeneration.

From a number of observations it was determined that when the liver was sufficiently damaged by an injection to provoke a van den Bergh reaction, this was detectable within twenty hours or less, and, unless death supervened, the curve of the reaction mounted to reach an apex on the second or third day. For routine purposes, unless one proposes to give injections at shorter intervals, a good time for determining the van den Bergh reaction to an injection is two days later.

As the experiments proceeded it became increasingly probable that if an injection is *not* followed by a van den Bergh reaction then it is safe to repeat that dose. However, as absence of reaction merely indicates absence of necrosis, but not necessarily absence of lesser injury to the liver cells, the word "safe" is used only in the sense of "justified," in that this dose is unlikely to cause *fatal* necrosis.

The reverse, that if an injection sets up a reaction then it is unsafe to repeat the dose until the reaction has completely subsided, is almost certainly true. For example:—

Rabbit A8. Male. Weight, 2·5 kilos.

5/5/28. Injected with 1·9 c.c. of 2 per cent. T.E., *i.e.*, at the rate of 0·015 gm. per kilo. (1.)

7/5/28. Normal appearance. Plasma lemon coloured.

Van den Bergh. Good delayed direct, taking 10 minutes. Good indirect of 1·5 units.

Injected with 1·9 c.c. of 2 per cent. T.E., *i.e.*, the same dose as previously. (2.)

8/5/28. *Died* about 18 hours after the injection. The carcase was in fair condition. There were excess of serous fluids, acute enteritis, and congestion of lungs. The *liver* weighed 144 gm., was orange coloured, of fairly firm consistence, and the lobulation was distinct.

Although I was unable to examine sections of the liver of this animal, it is apparent that the first dose causes incomplete necrosis of parenchyma, and that this injury was turned into complete necrosis by the second dose.

Had I waited for recovery from the incomplete necrosis occasioned by the first dose, then a second dose might not have been fatal. For example:—

Rabbit A5. Female. Weight, 3·25 kilos.

24/4/28. Received 1·6 c.c. of 2 per cent. of T.E., *i.e.*, at rate of 0·01 gm. per kilo. (1.)

25/4/28. Dull, and feeding badly.
Van den Bergh. Good delayed direct. Distinct indirect of 1 unit.

26/4/28. General condition unchanged.
Van den Bergh. Strong delayed direct, taking 3 minutes. Good indirect of 1·5 units.

27/4/28. Bright, almost normal, in appearance. Plasma dark and reddish.
Van den Bergh. Distinct delayed direct, taking 3 minutes. Marked indirect of 3·5 units.

1/5/28. Normal appearance.
Van den Bergh. Practically negative—an unusually rapid subsidence. Received 1·6 c.c. of 2 per cent. T.E., *i.e.*, the same dose as previously. (2.)

2/5/28. Bright and lively.

3/5/28. Normal appearance. Plasma of deep lemon colour.
Van den Bergh. Good delayed direct, taking 5 minutes. Marked indirect of 3 units.

4/5/28. Normal appearance. Plasma light yellow.
Van den Bergh. Faint direct. Weak indirect of 0·2 units.

5/5/28. Appears to be in good health.
Destroyed. The carcase was of normal appearance except for excess of serous fluids. *Liver* weighed 116 gm., was somewhat light in colour, of firm consistence, and showing distinct lobulation. Microscopically the lobules appeared to be crowded with small, deeply-stained cells with a few faintly-stained larger ones. Osmic acid showed a few cells in state of fatty degeneration.

In this case the action on the liver of the first dose was the production of slight necrosis, followed by such rapid and complete recovery that the second injection, seven days later, had no more ill effect than the first. After provocation of a reaction by an injection, then, it is necessary to wait until recovery has occurred as indicated by complete subsidence of the reaction, before injections, even of lessened dose, can be resumed with reasonable safety. In the following case the reaction was allowed to subside considerably and the second dose was less than half the first, yet this caused necrosis to a degree which would almost certainly have proved fatal if the animal had not been deliberately destroyed.

Rabbit A2. Male. Weight, 3 kilos.

12/4/28. Received 2·25 c.c. of 2 per cent. T.E., *i.e.*, at the rate of 0·015 gm. per kilo. (1.)

14/4/28. Dull. Ate a little, but without appetite.
Van den Bergh. Strong delayed direct, taking 10 minutes. Strong indirect of 5 units.

16/4/28. Again bright and lively, with almost normal appetite. Weight has fallen to 2·5 kilos. Plasma dark.
Van den Bergh. Strong delayed direct, taking 6 minutes. Good indirect of 2·5 units. Received 0·95 c.c. of 2 per cent. T.E., *i.e.*, less than half the former dose. (2.)

17/4/28. Dull. Almost entirely off feed.

18/4/28. Condition unchanged. Plasma dark reddish.
Van den Bergh. Strong delayed direct, taking 10 minutes. Strong indirect of 4 units.
Destroyed. Carcase in fair condition, but jaundiced. Stomach distended with dry food, though intestines nearly empty. Bladder distended with greenish-brown urine rich in bile pigments. *Liver* was very small, weighing only 66 gm.; of uniform ochre colour, firm consistence. Bile, thick, green. Microscopically, there was almost complete necrosis of parenchyma, accompanied by real or apparent proliferation of small bile ducts. Osmic acid showed droplets of fat of various sizes, individual and aggregated, scattered throughout the lobules.

Had this animal not been destroyed, he would almost certainly have succumbed to this acute yellow atrophy. On the other hand, he was so bright before the second dose that he would almost certainly have recovered from the effects of the first alone.

Although a single dose may produce no *van den Bergh* reaction and can, therefore, be repeated without fear, yet it may have produced liver injury, *e.g.*, fatty degeneration short of actual necrosis, so that the next dose of the same size will engender a *van den Bergh* reaction. The cumulative effect of a series of apparently non-toxic doses was disconcertingly slow in the case now cited.

Rabbit B1. Male. Weight, 2·5 kilos.

Between *19/3/28* and *30/3/28* he received six injections at the rate of 0·01 gm. per kilo three times a week, without the production of symptoms, and with *van den Bergh* reactions negative throughout. Yet when, a month later, on *26/4/28*, he received a seventh dose he was rendered dull and the *van den Bergh* test two days afterwards gave a strong delayed direct reaction, taking 10 minutes and a very strong indirect reaction of 6 units. The eighth dose, given on *28/4/28*, at the height of the reaction, killed him.

Even in this case, if I had stopped injections after the grave warning given by the *van den Bergh* reaction, the animal would almost certainly have recovered, for he still retained the fair appetite which is compatible with partial, reparable necrosis but not with complete and, there-

fore, almost irreparable necrosis. In fact, the most significant result of this research is the evidence that if one starts with a small dose of tartar emetic which experience has taught will be safe in all but most exceptional and, therefore, negligible cases, one can afterwards gradually increase the dose and rely on the *van den Bergh* test to give ample warning of the onset of liver necrosis.

The following case illustrates this method :—

Rabbit A7. Female. Weight, 2·75 kilos.

28/4/28. Received 1·05 c.c. of 2 per cent. T.E., *i.e.*, at the rate of 0·0075 gm. per kilo. (A1.)

30/4/28. Unaffected. Plasma clear.
Van den Bergh. Negative.
Received 1·4 c.c. of 2 per cent. T.E., *i.e.*, at the rate of 0·01 gm. per kilo (B1.)

2/5/28. Unaffected.
Van den Bergh. Negative.
Received 1·4 c.c. of 2 per cent. T.E. (B2.)

3/5/28. Unaffected.
Van den Bergh. Negative.
Received 1·4 c.c. of 2 per cent. T.E. (B3.)

5/5/28. Unaffected.
Van den Bergh. Negative.
Received 2·1 c.c. of 2 per cent. T.E., *i.e.*, at the rate of ·015 gm. per kilo. (C1.)

7/5/28. Apparently unaffected. Plasma pale.
Van den Bergh. Negative.
Received 2·1 c.c. of 2 per cent. T.E. (C2.)

8/5/28 .Apparently unaffected. Plasma clear, though sample slightly hæmolysed.
Van den Bergh. Negative.
Destroyed. A fat pregnant carcase with some excess of serous fluids.
The liver weighed 108 gm. It was light-coloured. Lobulation distinct, with gelatinous-looking peripheries bounding pale, firmer centres. The whole cut surface had an oily appearance. Consistence somewhat soft. Microscopically, the parenchyma cells, especially of the peripheral two-thirds of each lobule, were laden with fat. Stained with hæmatoxylin and eosin these cells stained lightly and had a vacuolated appearance. The cells of the central zone of the lobule were almost normal.

This case is of particular interest in that the animal was destroyed at the right time for sections of the liver to show the cell change which precedes actual necrosis, but which does not give rise to a *van den Bergh* reaction. Almost certainly another dose of T.E. would have turned this fatty degeneration into an actual necrosis furnishing a strong *van den Bergh* reaction.

The *van den Bergh* test is simple, and not only qualitative but in a useful measure quantitative. As it appears to meet all the demands of the test which it was the object of this research to find, it is unnecessary for me to refer at length to any other. I shall describe briefly, however, the Fouchet test for bile-pigment, as qualitatively it is almost as delicate as the *van den Bergh* one.

Fouchet's Test. The necessary re-agent is composed of :

Trichloracetic acid	5 gm.
Ferric chloride sol. (9 per cent.)...	2 c.c.
Water	20 c.c.

The essence of the test is the green colour which appears in the presence of bile-pigment when the re-agent and plasma are mixed.

A simple way of applying the test is to add an equal quantity of the re-agent to a few drops of plasma at the bottom of a test-tube, when the green colour is evoked almost immediately. As, however, even normal rabbit plasma, quite negative to the *van den Bergh* re-agent, gives a faint green tint to a Fouchet test carried out in this way, I prefer the following method :—

A large drop of Fouchet's re-agent is placed on a white porcelain slab, and a single smaller drop of the plasma allowed to fall on to the re-agent, displacing this so that the drop of plasma is completely surrounded. After twenty minutes the preparation is inspected, and the presence of a bright green ring at the junction of the two liquids indicates a positive reaction. A mere greenish tinge is ignored.

The results of this qualitative test were in entire agreement with the *van den Bergh* reactions ; and it is thus, as McNee says, a good and delicate confirmatory test of the presence of bile pigment in blood-serum or plasma.

Summary.

The chief drawback to the use of tartar emetic as a trypanocide is that it may cause acute liver necrosis.

Ordinarily, liver necrosis is the result of a series of doses ; and this research had as its objective the finding of a simple liver-function test which would reveal the effect on that organ of previous injections, and divulge with what safety the next could be given.

It was thought that the *van den Bergh* test of bile-pigments in serum or plasma might fulfil these conditions. A description of the test is given.

Using initially healthy rabbits it was possible to produce various degrees of liver injury by means of intravenous injections of tartar emetic, and to correlate the lesions with plasma reactions to the *van den Bergh* test.

When a series of medicinal doses of tartar emetic are given, the injection which causes fatal necrosis is generally preceded by one which occasions only slight necrosis, and it is for the detection of this early injury that the *van den Bergh* test is particularly valuable.

Damage to liver cells amounting to acute fatty degeneration, but short of actual necrosis, may not provoke a *van den Bergh* reaction. Nevertheless, the rule is that if an injection is *not* followed by a *van den Bergh* reaction, it is safe to repeat the dose.

Reversely, if an injection sets up a reaction then it is unsafe to repeat the dose until the reaction has subsided completely.

It is recommended that in tartar emetic therapy one should start with the small dose that experience has taught is safe, and use the *van den Bergh* test while raising the dose to the desired medicinal one and to the end of treatment.

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N.V.M.A. Congress.

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a.m.	a.m.	a.m.	a.m.
1 10*ql*	7 2	1 15*mxl*	7 5
4 45	11 10	1 31*sl*	7 20
	p.m.	1 50*mxsl*	7 30
7 15*r*	2 49		p.m.
9 30*rb*	3 3	8 0*r*	1 30
10 5*r*	3 36	9 10*P*	3 0
10 15*r*	5 15*w*	10 25*r*	4 30
11 15*P*	4 57	p.m.	
11 50*r*	5 29	12 55*r*	6 30
p.m.		1 54*P*	7 35
1 5*rc*	6 49	1 2*r*	8 0
1 15*r*	6 53	2 45*r*	9 25
1 40*r*	8 19	4 26*r*	10 5
4 45*P*	10 25		a.m.
5 30*r*	10 38	8 5	2 45
5 35*r*	11 41	11 0*sxsl*	5 15
	a.m.	11 13*sl*	5 55
7 25*sxr*	12 57	—	—
7 40*sxrsl*	1 12	—	—
8 25	3 4	—	—
10 35*sl*	4 35	—	—
10 45*sxsl*	5 16	—	—
10 45*so*	5 49	—	—

SUNDAYS.

King's Cross.	Newcastle.	Newcastle.	King's Cross.
a.m.	p.m.	a.m.	a.m.
8 30	5 42	1 31*sl*	7 20
11 40*r*	6 8	1 50*sl*	7 30
p.m.			p.m.
5 0*r*	11 58	10 5*r*	5 13
	a.m.	p.m.	
7 40*srl*	1 12	1 58*r*	7 45
8 25	3 4	2 20*r*	8 30
10 35*sl*	4 35	4 55*ra*	10 30
10 45*sl*	5 16		a.m.
—	—	7 8	3 35
—	—	11 0*sl*	5 15
—	—	11 13	5 55

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Fouchet's test is described. It is a good and delicate confirmatory test of the presence of bile pigment in serum or plasma.

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This work was done in the laboratories of the Department of Pharmacology, University College, London, under the direction of Professor E. B. Verney, to whom, and to Drs. J. W. McNee and W. G. Barnard, of University College Hospital Medical School, I gratefully acknowledge indebtedness.

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11th August, 1928.

THE ANNUAL CONGRESS.

The issue of the Handbook comes as a reminder of the nearness of the Annual Congress of the Association and all that it stands for in the progress of the profession. The local Committee have spent much time and trouble during the year in making and perfecting arrangements which will make for the success of the Congress, and to ensure this all that is required is a good attendance of members and their friends. The old northern town and counties have many attractions of historic interest, and the beauties of what still remain to us as "the borders" have to be seen to be appreciated. To those, therefore, who make the occasion of the Congress a period of holiday, a full measure of enjoyment presents itself. Roman antiquity in solid form, old castles reminiscent of glorious pages of history of a stout race of people, beautiful little rivers with their wooded banks, a fine agricultural country, and a stretch of coast line renowned for good, strong, healthy air, invite and will repay the holiday lover.

The profession cannot but feel deeply honoured and grateful for the privilege which has been extended to the Association in the use of the fine buildings of the Armstrong College for purposes of the Congress, and our first thought is in acknowledgement of our sincerest thanks to the Authorities of the College for their kindness in placing such facilities in our way. We are assured, too, of a hearty welcome from the Lord Mayor and City Corporation, and for the Civic Reception on Tuesday evening, the 4th September, Members are specially asked to notify the Local Secretary without delay of their intention to be present, so that the necessary formal invitations may be issued. A feature of this year's Congress, which we feel sure will add to the dignity of the occasion, is the Church Service on Sunday, at St. Nicholas Cathedral, and it is hoped that members and ladies will take part in it.

Of the real business of the Congress there is no dearth in the papers for discussion, and in the practical demonstrations arranged. The papers are well chosen, the practical side of Veterinary Science being as much in evidence as the scientific. For this reason full scope is presented to general practitioners in discussion, and it is needless to say that records of their opinions on the various points raised will be valuable. The subjects under consideration also include matters of great interest to the general public, and it is to be hoped that members will induce their friends and clients to come to any discussion in which they may be interested, supplying them with a copy, or copies, of the papers beforehand, so that they may appreciate the points raised. For instance, the subject of "Lamb Dysentery" is bound to appeal to the flock-masters of Northumberland; fat stock raisers will appreciate the discussion on the "Adulteration of Foods and its effects on Animals," and we depend on the valuable opinions expressed by breeders and agriculturalists for the success of the paper on "The Horse as a National Economic Factor," and for the achievement of its main object in giving a stimulus to horse production. The ever-popular and most important subject of "Milk"—simply so described, that all may understand—in the hands of so well-known an authority as Colonel Brittlebank, is most appropriate in the heart of a city which takes great pride in the efficiency of its Public Health Services.

Altogether, we feel sure that another profitable and enjoyable Session of Congress will be added to those of previous years, and it is fitting at this stage to express to the Provisional Committee the best thanks of the Association for all that the members of the Committee have done to make the Congress of 1928 an occasion that will live long in our memories.

We should also like to call attention specially to the Trade Exhibition, which is to be formally opened by the President, on Monday morning, 3rd September, and we trust that, by their attendance, members will show their appreciation of those good friends who have stood by the profession for so many years, and who have catered for our needs in business matters in a manner which has been so universally pleasant and satisfactory.

COMMITTEE ON THE RECONSTRUCTION OF THE ROYAL VETERINARY COLLEGE.

At the request of the governors of the Royal Veterinary College, Camden Town, the Minister of Agriculture and Fisheries has appointed a Departmental Committee, under the chairmanship of Sir C. J. Martin, C.M.G., D.Sc., F.R.S., director of the Lister Institute:—

To consider and report generally on the reconstruction of the Royal Veterinary College and the probable cost; and in particular on the questions what accommodation should be provided, having regard to the training to be given; whether that accommodation can and should be provided on the present site; if not, where the college should be transferred; and what arrangements should be made in respect of the Animal Pathology Research Institute now situated at the college, if it appears necessary to change the existing arrangements.

The Committee consists of:—

Sir C. J. Martin (chairman), Dr. O. Charnock Bradley, M.D., D.Sc., M.R.C.V.S., Sir Merrik Burrell, Bt., C.B.E., Mr. H. E. Dale, C.B., Sir W. M. Fletcher, K.C.B., Sc.D., F.R.S., Mr. J. R. Jackson, M.R.C.V.S., Sir E. Cooper Perry, M.D., F.R.C.P., Major-General H. T. Sawyer, C.B., D.S.O., and Lieutenant-Colonel Sir Archibald Weigall, K.C.M.G.

Mr. V. E. Wilkins, of the Ministry of Agriculture and Fisheries, will act as secretary to the Committee, and all communications relating thereto should be addressed to him.

CLINICAL AND CASE REPORTS.

Notes on Clinical Cases.*

By Major G. GREEN, M.R.C.V.S.,
Rotherham.

In presenting to you a few Notes on Clinical Cases, I have endeavoured, so far as possible, to select those cases that I hope will not only be of interest, but will, I trust, provide an instructive and profitable discussion.

"TRAUMATIC INDIGESTION."

I desire first to give you a record of two cases of "traumatic indigestion." This condition is, as we are all well aware, of common occurrence, and traumatism may be a far more common cause of indigestion than we are prone to think.

(a) *December*, 1927.

My assistant was called in to see a cow, which had been off its feed for two or three days. He found it very dull, standing in a stiff fixed position, with forelegs propped slightly forward, nose protruded, and an anxious look about the eyes.

The appetite was in abeyance, secretion of milk greatly reduced, and rumination suspended, the animal showing a great disinclination to move, but when made to do so it emitted a subdued painful grunt. Temperature 102.6° F., pulse rapid, respirations normal, rumen partially filled with ingesta, and there was a little tympany.

Diagnosis. Indigestion, probably traumatic in origin.

Treatment. Mag. sulph ℥iii, with ammon. carb.. nux vom. and sodii carb.

I visited next day, and found the cow in the same fixed position, but the symptoms aggravated. The temperature had risen to 104°F. ; the animal was very stiff with the same disinclination to move. Fæces passed in small quantities and the animal emitted at irregular intervals the low painful grunt as heard on the previous day, whilst around and above the rumen was distinct evidence of peritoneal tympany, through which the rumen, partially filled with ingesta, could be felt. I made a careful examination of the heart but could detect no sounds typical of those in traumatic pericarditis.

I agreed with the diagnosis my assistant had made—that the condition was probably of traumatic origin, and decided to try Prof. David Imrie's treatment.

The cow was placed upon a platform, the front of which was raised about twelve inches. Instructions were given that nothing but small quantities of water should be offered, and to continue with the ammon. carb and nux vom. powders.

I visited again next day and found the animal greatly improved. She was passing considerable quantities of fæces, the anxious look had gone, the grunt had almost disappeared, the temperature had dropped to 102° F., and the animal was moving more freely and looking about for food. I advised gruel and mashes. She commenced ruminating and made an uninterrupted recovery. I saw her three months afterwards and she had had no recurrence of the trouble.

(b) *January 15th*, 1928.

I was called in to see a cow (calved four weeks) which had likewise been off her feed for three days. I found her standing "all in a piece," with the same low painful grunt and disinclination to move. Temperature 105° F., pulse rapid, but no evidence of traumatic pericarditis on auscultation. There was distinct peritoneal tympany ; the rumen was replete with food, which could be felt as a doughy mass, through the intervening layer of gas ; rumination was suspended, appetite was in abeyance, and fæces were passed in small quantities.

Diagnosis. Traumatic indigestion.

Treatment. As in the other case, the animal being placed upon the platform.

January 16th. The cow was appreciably better ; temperature 103.2° F., moving more freely and inclined to feed a little. I prescribed ammon. carb. and nux vomica.

January 17th. The animal greatly improved, rumination commencing, passage of large quantities of fæces. She was put on to gruel and mashes, and made an uninterrupted recovery.

In all cases it is important to make a careful examination of the heart for evidence of traumatic pericarditis. The advanced cases are, of course, hopeless to treat.

Before leaving this subject, I would like to express an appreciation of Prof. David Imrie, for placing before us the details of his valuable treatment, for use in cases such as those described above.

AUTO-INTOXICATION CASES.

The following cases and notes will, I trust, be of peculiar interest, as this is the season when such cases most frequently occur, and are often the cause of great loss to the stockowner.

I. *May 27th*, 1924.

I was called in to see a bullock, one of a herd of twenty-eight, grazing in a park, which had been found in the early morning staggering about in a deep grassy hollow in the park, and which had with difficulty been driven into the buildings. I found it in a box, suffering from great nervous excitement. It was lashing its tail and bellowing out loudly ; the head drawn to one side. There was distressing palpitation of the heart, the sounds of which could be heard outside the box, and with the most profuse perspiration I have ever seen. Pulse rapid and temperature 102.4° F. The condition of the animal was so extreme that I advised immediate slaughter.

Post-mortem revealed very little, except a congestion of the mucous membranes of the abomasum and the intestines. The carcase itself was marketable.

At 8 p.m. on the same day, I was again called to see another bullock of the same breed. This, which, along with the others, had on inspection at my previous visit appeared to be all right, was noticed about 5 p.m. to have wandered away from the others, and was found behaving in a strange manner, walking around in circles. This perambulation continued for about half an hour, when the animal fell down dead. I examined the blood for anthrax, which proved negative.

Post-mortem revealed the same condition as in the previous case.

* Cases presented to the North Midland Division N.V.M.A. at Sheffield on 29th May, 1928.

The following morning a third bullock was found to be ill, likewise showing brain lesions—boring the head into a corner, staggering gait, and totally blind, with diarrhœa. This animal was slaughtered and revealed the same *post-mortem* lesions. The carcase was passed for food.

Diagnosis. Auto-intoxication, due to a sudden change of diet.

These bullocks had been recently moved into the park, which was full of rich, luscious and abundant herbage, which, owing to a sudden change from cold to warm, genial weather, had grown rapidly, and was so sweet and succulent that these bullocks, which had been fed more or less on dry foods, gorged themselves to the utmost—to such an extent, indeed, that the stomach could not accommoddate itself to this sudden change. Digestion was consequently impaired and rumination suspended, with the resultant fermentation of undigested food, and the formation of virulent toxins, which, being rapidly absorbed, acted as a most virulent poison, producing these varying cerebral symptoms with paralysing effects.

The remaining bullocks were removed to a poorer and barer pasture, and no other cases were recorded.

II. A week ago I was called in to see a cow that in the morning was noticed to be unwell, with loss of appetite, suspension of rumination and decrease in secretion of milk. In the evening it was noticed to stagger, and on my arrival was found down and unable to rise, with paralysis of the limbs.

The animal was semi-conscious and delirious, throwing the head from side to side. There was champing of the jaws; the body was bathed in perspiration, pulse very rapid, temperature 104° F., with slight diarrhœa.

Diagnosis. Auto-intoxication.

History. Two days prior to my visit, the cow had been turned into a very rich luxuriant pasture, knee deep in grass.

Treatment. I immediately inflated the udder, as in a case of milk fever, propped the animal up on the sternum, and in an hour's time she became more conscious, and I was able to administer ℥xvj of mag. sulph. Next morning the cow was up, all signs of cerebral excitement had passed, and she was looking around for food. She made an uninterrupted recovery.

This condition also affects sheep and likewise occurs in house-fed animals, especially towards the end of the winter months, when roots become scarce, and the diet becomes of a more highly nutritious character, without any efficient element being substituted for the roots.

As a general recommendation, I would advise in all cases in cows and ewes, where these brain lesions become manifest, that immediate inflation of the udder be resorted to, and that a change of pasture or a change of food from a highly nutritious or succulent diet to an inferior one be at once made, so far as the rest of the herd or flock is concerned.

The term "*Stomach Staggers*" used to be applied to this condition, but this I do not consider scientific, and that it should not be so applied. It has also been termed cerebro-spinal meningitis, but this again, in my opinion, is wrong, as I do not think there is any cerebro-spinal meningitis, but that it is a pure case of intoxication. This opens up a wide field for investigation and research into the unknown effects of many vegetable poisons of which we know little or nothing except of their fatal and paralysing actions on the nervous system.

Recurrent Tympany in Cattle.

November 11th. I was called to see a cow suffering from distressing tympany of the rumen. I tapped her and the symptoms at once subsided and in a quarter of an hour she was chewing her cud. I prescribed ammon. carb., nux vom. and sod. bicarb.

November 12th. Apparently recovered, appetite normal, rumination regular.

November 15th. Called in again. Great distension of ume n with gas. I passed the probang and felt it distinctly rstop in the middle part of the chest, and then pass on. I inquired into her history and found that before calving she had been in fine condition, but since had lost flesh, put down to her being a heavy milker. I examined her lungs and found a dull patch in the middle area.

Diagnosis. Tuberculous enlargement of the mediastinal glands.

On my advice she was slaughtered. I found the largest tuberculous mediastinal I have ever seen.

The obstruction to the passage of the probang was the deciding factor in this case so far as my diagnosis was concerned.

Tuberculosis of the Spleen in the Horse.

June 8th, 1926. Called in to see a bay two-year-old cart filly off her feed and losing condition.

History. From being a healthy, strong filly, the animal had, two or three months prior to my visit, commenced to lose condition, and her appetite was fickle—sometimes she would feed well, at other times eat little or nothing. The owners thought the teeth were the cause of the trouble.

I found the filly dull, listless and tucked up and, although not actually emaciated, she had a narrow unhealthy appearance.

Her temperature was 102° F., pulse rapid and weak. She would stand with legs propped forward and moved very stiffly.

I came to the conclusion there was probably some malignant internal trouble.

After emptying the rectum, I passed my arm into the bowel, and, well up on the right of the middle line, could distinctly feel the nodular surface of a very enlarged spleen.

Diagnosis. Tuberculosis of spleen. I advised my client to have her slaughtered.

Post-mortem revealed a huge tuberculous spleen covered with tuberculous nodules, varying in size. The interesting point in this case was my ability to reach the spleen *per rectum*.

. . . . . .

Discussion.

Mr. T. C. Fletcher opened the discussion on each case. He said that he would like to disagree with Mr. Green in regard to traumatic indigestion and his claims for recovery by using Prof. Imrie's treatment. To his mind, the cases might have been cured without the treatment on the boards, for Mr. Green gave no definite symptoms by which he could agree that the cases were suffering from traumatic indigestion. If an animal affected with traumatic indigestion was treated with ammon. carb. and nux vom. it would very often begin to show a temporary improvement

a day or two later. It would be interesting if Mr. Green could trace these animals and see how they went on.

Mr. R. HUDSON regretted that he only had time to get a glimpse at Mr. Green's paper. The great difficulty was to satisfy one's self that one had traumatic pericarditis. Recently he had a case where a cow showed peritoneal tympany pains and anxious expression, but there was no noise of fluid in the heart. He put this cow on Prof. Imrie's treatment and got recovery in fourteen days. Peritoneal tympany was not peculiar to traumatic indigestion. He had seen it in young cattle lying on cold ground in the spring of the year. Septic fluid often escaped from the reticulum and set up a local peritonitis and one got adhesions, which often caused interference with the liver, etc., symptoms exhibited by the patient for some time. It was difficult to understand how raising an animal in front would always withdraw the foreign body, because one still had pressure from the weight of the abdominal organs against the diaphragm to contend with.

Mr. W. COLLINSON joined in thanking Mr. Green for his paper. In one case Mr. Green had a sudden drop in the temperature in twenty-four hours. Did he not think that unusual for traumatic pericarditis? Sometimes symptoms of traumatic pericarditis had a very sudden onset and death took place quickly.

Mr. S. E. SAMPSON asked the essayist to distinguish between dry pericarditis and ordinary indigestion. It had been his experience to meet with cases where the foreign body penetrated other organs, especially the lungs, and confused the symptoms with those of pneumonia. What became of the peritoneal tympany when the animal was put on the boards?

The PRESIDENT (Mr. G. J. Furness) remarked that he found the temperature in the diagnosis of traumatic pericarditis of value—a high temperature of 104° to 105° F. at the start and often remaining elevated. As a rule, it took one some days to establish a definite diagnosis of traumatic pericarditis.

Mr. T. C. FLETCHER remarked that the condition of auto-intoxication was somewhat like "grass staggers," and it was his procedure to treat as in milk fever. The bullocks died in Mr. Green's case. (Laughter.)

Mr. J. ABSON said that he saw those bullocks in consultation with Mr. Green. Death quickly took place, but the remaining bullocks were moved to bare pastures, and no further loss occurred.

Mr. R. HUDSON remarked that that was an appropriate subject for this time of year. Overloading of the stomach and reflex action from the stomach by food often occurred. One got many manifestations of so-called "grass staggers." He had seen cows down with paralytic symptoms and on *post-mortem* found acute inflammation of the intestines with the contents very blood-stained. Those cases often gave a history of exposure to chill from standing in ponds, etc. In other cases there was local peritonitis present, with impaction.

Mr. S. E. SAMPSON said he had seen it in ewes in luxuriant grass, and had had success with inflation of the ewes' udders. He thought large doses of saline per stomach tube at the onset useful and believed that if animals were given a dose of salts when the sudden change of food from winter to summer grass took place cattle would be all the better for it. The same condition was sometimes seen in horses.

Mr. COLLINSON remarked that farmers in his district did not favour emergency slaughter. In tympany he had better results from passing in the fluid with an enema pump and teat syphon per canula than per stomach pump. He recommended saline and formalin. He failed to see how inflation of the udder in cows could counteract absorption of toxins from stomach.

Mr. M. ROBINSON asked if Mr. Green thought it advisable to recommend slaughter of an animal when it had a high temperature.

The PRESIDENT said that he could add very little further. He once overcame the difficulty in a bullock by injecting oxygen beneath the skin and got recovery.

Mr. T. C. FLETCHER thought recurrent tympany in cattle was often due to enlarged tuberculous mediastinal glands, and passing the probang gave one an idea if there was an obstruction. He was interested in the essayist being able to feel the spleen *per rectum*.

Mr. R. HUDSON asked if Mr. Green could give a cause for recurrent tympany very often seen in young animals, no cause being apparent. He had lately met with three cases of tuberculosis of the horse where the submaxilliary glands were enlarged. They reacted to the intradermal tuberculin test.

Mr. S. E. SAMPSON asked if Mr. Green noted any stiffness in the neck of the filly. Usually there was infection of the neck vertebræ. He also made a practice of enquiring if the horse had any cow's milk and found that very often they had. In one case it was ascertained that the attendant had, unknown to the owner, given the foal some cow's milk in getting it ready for show purposes. That milk might have been the source of infection.

Mr. W. COLLINSON said that 8 c.c. of tuberculin was recommended subcutaneously in the tuberculin test for the horse.

Mr. C. S. SMITH gave his experience of tuberculosis as met with in pit ponies, and remarked how often the vertebræ were affected.

Mr. W. TWEED thanked Mr. Green for his attendance and giving the notes on those cases. Records of cases which seemed of no importance might very often supply the information for which some other observer was looking. The habit of taking notes on cases should be cultivated. In years they accumulated and, if they did nothing else, certainly aided one to benefit more fully from subsequent reading and experience.

Mr. GREEN, replying, said that he was more than satisfied with the discussion that had ensued. He was not surprised at some disagreement being expressed concerning his diagnosis of traumatic pericarditis, but, as they would realise, there was often something about a case of traumatic indigestion which gave the impression right away that one was dealing with such a case. They must not forget that if actual penetration of the pericardium had not taken place a local peritonitis might be all that was causing symptoms, and even if the retraction of the foreign body did not take place its direction might be altered.

In reply to Mr. Collinson's point and also that of Mr. Robinson about slaughter of animals being favoured in some districts more than others, Mr. LLOYD said that a lot depended, in his opinion, on the stage at which the animals were slaughtered as to whether or not they would be passed for food. If an animal had had a high temperature for some time it was likely to dress out an unfit carcase and so treatment, even if they died, was the preferable procedure.

Mr. LLOYD thanked the President and Mr. Green for the very enjoyable meeting and the good discussion they had had.

He appreciated the points raised in the discussion and thanked those present for taking part in it.

J. S. LLOYD, *Hon. Secretary.*

ABSTRACT.

(**Traumatic Endocarditis caused by a Pin.** *Rivista de Higiene y Sanidad Pecuarias*, July, 1928.)

The animal, a two-year-old heifer, was slaughtered on the third day of its illness. As the symptoms observed had attracted attention to the lungs, these were examined at a *post-mortem* made nine hours after slaughter. The organs showed congestion and ecchymotic spots on the superior surfaces.

The heart appeared normal on an outside view. On opening and dissecting away the pericardium a small adhesion was found. When the heart muscle was cut, a black pin, about two inches long, came into view. The point of the pin projected a considerable way into the right ventricular cavity. There was a considerable area

(*Continued at foot of first column next page.*)

DIVISIONAL REPORTS.

North Midland Division.*

PRESIDENT'S ADDRESS AT SHEFFIELD.

A meeting of the North Midland Division, N.V.M.A., was held at the King's Head Hotel, Change Alley, Sheffield, on May 29th, 1928.

The Chair was taken by the President, Mr. G. J. Furness, the following also being present: Messrs. W. Collinson, G. Green, E. G. Johnson, T. C. Fletcher, M. Robinson, S. E. Sampson, C. Secker Smith, J. S. Lloyd, J. Abson, W. Tweed, and R. Hudson. An apology for non-attendance was received from Mr. E. Marrison (Bakewell).

The minutes of the last meeting were taken as read.

CORRESPONDENCE.

(*a*) Appeal from N.V.M.A. for the supply of professional literature dealing with clinical reports of cases of interest for insertion in the *Veterinary Record*.

(*b*) Correspondence relating to the Jewish method of slaughter.

(*c*) Correspondence relating to compulsory pupilage for students before presenting themselves for their M.R.C.V.S. diploma.

(*d*) Letter from Dr. Sheather thanking the Division for their support in obtaining registration of his premises under the Vivisection Act.

(*e*) Correspondence relating to the election of representatives on the Council of the N.V.M.A.

(*f*) Correspondence relating to the formation of a Veterinary Inspectors' Section of the Association.

Arising out of the correspondence, it was decided that the President and Secretary be asked to serve on the Council of the N.V.M.A.

The Secretary pointed out that, in regard to the formation of a Veterinary Inspectors' Section of the Association, it was decided at the last meeting that in the opinion of the members present all matters affecting the members could be dealt with by the Council of the Division.

ADDRESS BY THE PRESIDENT.

Mr. G. J. FURNESS then gave his Presidential Address, as follows:—

I count it a great honour to have been elected, by your good pleasure, President of this Northern Branch of the Midland Division of the National Veterinary Medical Association. As you are aware, I am a country practitioner working in an agricultural and coal-mining area in Derbyshire, a considerable distance from this centre of operations, but, as Mr. Lloyd was kind enough to remind me a few months ago, I have been a member of this branch since its formation in 1913, and I claim to have an unabated interest in its welfare. (Applause.)

It seems to be appropriate that, on an occasion of this kind, reference should be made to the retirement of Sir John M'Fadyean, Principal of the London Veterinary College, whose eminent services to veterinary science are too well known to you to need elaboration from me. We shall all hope that Sir John will be spared for many years to enjoy his retirement, and, if occasion arises, to give us still the benefit of his almost unique experience. (Hear, hear.) It is with undisguised satisfaction that we welcome Prof. Hobday as Sir John's successor. (Applause.) His name and his attainments are a sure guarantee that Sir John M'Fadyean's great work has been entrusted to capable hands, and incidentally we trust that the rebuilding scheme of the Royal Veterinary College, which Prof. Hobday has so much at heart, will be successful. Here may I be permitted to remark that the financial support which is being given to the scheme by the members of the Royal College of Veterinary Surgeons seems to be quite inadequate having regard to its urgent need, and still more to its potential usefulness to the profession, and indeed to the community at large. The estimated cost is certainly great, amounting to not less than a quarter of a million pounds, so that the task before us cannot be described as a light one. I do not wish to criticise our members for their luke-warm support, except in a general way, since I myself come under a like condemnation, but I hope the branch will not take it amiss if I suggest that an effort should be made, either individually or collectively, to push forward this very deserving object.

In common, I suppose, with all other institutions, our profession has undergone and is undergoing a period of change in its strength and status. On the face of it, the change does not appear to be altogether encouraging, without careful examination and explanation. I find that in 1895 there were 3,120 graduates and 667 existing practitioners under the Veterinary Surgeons Act of 1881. In 1927 there were 3,496 graduates, and 63 existing practitioners, a total of 3,559, or 228 fewer than in 1895.

Now the cause of this marked decrease in the number of qualified veterinary surgeons is, of course, not far to seek. It is due to the development of mechanical transport, the electrification of tramways, and so forth, with the natural consequent reduction in the number of horses used. One authority, I think Professor Hobday, told us some time ago, however, that in London at the present time there were more horses being used than in 1913 or 1914, but I confess that I, for one, do not contemplate any permanent return to the horse. Some months ago the Shire Horse Society struck a sanguine note—large firms were reported to have said that for short journeys in town horse traction is more economical than motor transport.

In its account of this year's Cart Horse Parade in Regent's Park, London, the *Daily Mail* stated: "Speaking to a *Daily Mail* reporter, Sir Walter Gilbey, the president and one of the judges, was optimistic about the future of

(*Continued from previous page.*)

of endocarditis, and a fairly large quantity of coagulated blood, giving off a foul odour. Particles of necrotic tissue, apparently detached from the endocardium, were embedded in the clot.

The author believes that the pulmonary lesions were metastatic, originating from the endocarditis.

The peculiar feature of this case is the fact that pericarditis had not preceded the endocarditis.

Unfortunately the stomachs had been disposed of, though examination would probably have had little result, owing to the smallness of the foreign body.

H. V. M.

* Received on July 10th.

the cart horse. He said: 'Owners are discovering that for short distances the horse is economically unrivalled for the work required. Corporations especially are going back to horses again—Glasgow is a recent example. The Government has helped us now by a petrol tax, so I am certain that, all sentiment apart, cart horses will soon be used against almost as frequently as they were before the days of cars. A car lasts for four years, but a horse for eight.'"

Be that as it may, it would be a poor compliment to the inventive genius of the motor engineer to expect a general return to horse traction.

However that may be, our young men are drifting into the motor trades instead of to the veterinary colleges—a natural development of modern conditions which we cannot avert even if we desired to do so. But I am sanguine enough to believe that even these difficulties will bring with them their own compensations. I feel that we can still live. More animals other than horses are being kept, herds of dairy cattle are increasing to meet the greater demands of the milk trade, stimulated as it is by mechanical transport facilities. At this point I had just fallen back upon the "herd" as a means of preserving and prolonging the life of the profession when I was confronted with the following in the daily press headed "Milk without Cows."

"Mr. A. King, of Eston, near Middlesbrough, speaking at the Sanitary Inspectors' Association Conference at Northallerton, Yorkshire, said the time was coming when milk would be produced without the help of cows or farmers. Experiments were being carried on at Billingham-on-Tees, in the production of synthetic milk direct from grass by a process which eliminated the cow."

If these scientists should be successful in their efforts, let us hope they will produce something more approaching the genuine article, and a less evil-smelling substance than that pressed upon the public some years ago as synthetic turpentine. Personally, I have no fear for the fate of the dairy cow, provided the farmer will put his cowhouse in order, and this should be done without any elaborate structural alterations. The essentials are light, ventilation, impervious floors, drainage, and, above all, the personal factor, which has proved beyond doubt that clean milk can be produced in other than expensively fitted byres; still, it would be folly to ignore the work of the scientists, for are we not seeing that the impossible—of yesterday—is continually being accomplished and the incredible achieved?

I would also point out that more, and still more veterinary surgeons are being employed by the public authorities, and I would further urge that those public veterinary surgeons are not necessarily hostile to the general practitioner. There will be a sharp line of demarcation between the general practitioner, and the full-time veterinary surgeon of a public authority.

If there be a keynote in my remarks I would wish it to be this—we must encourage co-operation with the public authorities in the proper working of the various orders which will be made from time to time. Such co-operation will redound to our own credit and to the betterment of the community at large.

There is little that one can say that is new about the treatment of foot-and-mouth disease, which some years ago devastated so many of the herds of the country, and is still breaking out sporadically. The fact is, the problem of finding an effective remedy for this dire scourge is still with us, and we are awaiting impatiently for our research workers to find one for us. Until a happy discovery is made by science, I fear that the harsh and apparently wasteful slaughter policy must continue. All we can do is to live in hope. I am convinced that what often seems to be an indiscriminate slaughter of valuable cattle is repugnant to every veterinary surgeon in the country. (Hear, hear.) We accept it as a painful necessity in our present incomplete knowledge of this baffling contagion. Patient, scientific research can alone help us. May that help come soon.

The complete eradication of tuberculosis in cattle is the ideal at which we are all aiming. This would necessitate an immense amount of work and either expense to the Government, or, for the present, at any rate, loss to the owners.

In the present state of agriculture the stockkeeper could not be called upon to shoulder the burden. In some American and Continental States, tuberculosis in cattle is being practically stamped out, and I see no reason why this disease, if firmly and energetically tackled by the Government and owners alike, should not in a few years be a disease of the past. At the outset it would undoubtedly be an expensive business, but the result would, I am confident, amply repay us for all our efforts. In the meantime, under the 1925 Tuberculosis Order, if properly administered, the danger to the human subject is happily reduced to a minimum.

The diseases incidental to dogs are receiving greater attention every year and will become a more important source of work and income to the veterinary surgeon than ever.

In concluding these somewhat discursive remarks, I must once more thank you for having elected me to this honourable position, and I appeal to you confidently for your loyal co-operation in doing what we can for our mutual well being, and also for the benefit of the community which we serve. (Loud applause.)

Mr. FLETCHER, in proposing a vote of thanks, said that he could only welcome Mr. Furness as their new President and thank him for his remarks, which dealt with the position of the profession as they found it to-day. He did not altogether agree with the President in wishing they had a remedy for foot-and-mouth disease; they wanted a preventive, and it was within the range of possibility that something would be found. The profession to-day was tending to burden the veterinary student too much, because, after all, he had a practice to make after graduation and it was only those who had got a practice in which to start who had not got a trying time before them.

Mr. LLOYD seconded the vote of thanks. The President spoke about foot-and-mouth disease, and there was one point that he would like to mention—that was in regard to the necessity for farmers to get their licences countersigned. Very often they could not get the police at their stations, and the result was that a lot of trouble and inconvenience was often caused. It was supposed that the police knew the district and what was happening in it, but very often that was not the case. He thought that once the area had been reduced from fifteen to five miles the

greatest element of danger was over, and in any case only cattle for immediate slaughter were allowed into the five mile area for a certain period, so that there did not seem to be any necessity for that extra trouble if care was exercised by those issuing the licences in the area into which the animals were to be moved, to see that the animal did not come from an infected area.

Mr. SAMPSON also thanked the President for his address. He was of the opinion that they were not getting sufficient veterinary surgeons' sons to enter the profession, nor the type of man that it deserved. If the total income of all the veterinary surgeons in any district was taken in the aggregate, one would think it sufficient attraction for men, instead of the lure of mechanics as it existed to-day.

The President then called on Mr. Green, of Rotherham, to read his paper on Clinical Cases.

[This paper, and the ensuing discussion, are reproduced in our Clinical and Case Reports Section this week.—Ed.]

J. S. LLOYD, *Hon. Secretary.*

Mid-West and South Wales Division.

VISIT TO THE WEYBRIDGE LABORATORIES OF THE MINISTRY OF AGRICULTURE.

For their summer meeting, held on Friday, July 20th, 1928, the members of this Division were glad to accept the invitation kindly extended to them by Dr. W. H. Andrews, the Director, to visit the Laboratories of the Ministry of Agriculture at New Haw, Weybridge. Despite the formidable nature of the journey for many from the far West, an excellent number met the President (Mr. J. C. Coleman) at Paddington at 1-30 and set out for their destination by motor coach. The heat wave being at its height, it was refreshing to pass from the sun-baked streets of Shepherd's Bush to the beautiful lengths of riverside beyond Richmond, then on by the packed Sandown Park enclosure (their Majesties being there to witness the Eclipse Stakes) to the heaths and woods of the Weybridge district. The tortuous nature of the route, and the driver's ignorance of it, delayed the arrival of the party at the Laboratories, where, in the absence of Dr. Andrews and Captain Doyle (Senior Research Officer), the members were given a most hearty welcome by Mr. W. Watt, of the Laboratories, and Mr. Arthur Holman Berry, of the Ministry's Veterinary Department. It was at once evident that the most complete arrangements had been made for the benefit of the party—a splendid programme to enable the members to witness, in the short time at their disposal, the chief features of the very varied and extensive work which is being carried out. The staff laid themselves out to give their visitors an interesting and informative afternoon, and their kindness was immensely appreciated by everyone.

Before the tour of inspection of the premises was entered upon, a short meeting was held, with the President in the Chair. There were also present, Messrs. J. R. Barker, E. C. Bovett, J. C. Bruce, R. W. Hall, J. Howard Jones, T. J. Margarson, R. Moore, C. E. Perry, B. Sayer, E. Sayer, W. R. Watson, W. Webster, W. R. Williams, and W. D. Rees (Hon. Secretary), with Dr. A. Leslie Sheather as a visitor.

The minutes of the previous meeting of the Division having been published in the *Record*, were taken as read, and were confirmed.

The only item of correspondence was a letter from Mr. J. L. Perry, of Cardiff, apologising for absence and drawing the attention of the Division to the new scale of mileage fees recently laid down for use by local veterinary inspectors doing work for the Ministry of Agriculture.

It was decided to refer this matter to the Council of the Division for consideration, with a view to the drafting of a resolution to be placed before the next general meeting.

Royal Veterinary College Re-building Fund. In the absence of Mr. A. S. Adams, Mr. W. R. Watson moved (in his name) "That the Mid-West and South Wales Division of the N.V.M.A. contribute the sum of ten guineas to the Re-building Fund of the Royal Veterinary College."

The resolution was seconded from the chair and carried unanimously.

This concluded the business of the meeting, and the President called upon Mr. Watt.

Mr. Watt expressed his regret at the absence of Dr. Andrews, who was away examining for the Royal College, and of Captain Doyle, both of whom were sincerely sorry that they were unable to meet the members of the Mid-West and South Wales Division on that occasion. In their absence he would give them a brief outling of the Institute and its work and then he and his colleagues would try and show them those features of the work which they thought would be of the greatest interest to them.

The laboratory was opened in 1917, and it was of the two-fold type: they had got their research work into diseases, conducted by the Ministry, and for the carrying on of which grants had been made, and there was also the diagnosis of the scheduled diseases. The staff consisted of three research officers, with officers in the field as detailed for special duty for diagnosis. Realising that there was a great deal of detail in the laboratory work which was being carried on, they had endeavoured to draw up a programme dealing more particularly with the diagnostic aspect, which they felt would be of greater interest to the members of the Society, as clinicians. The party would divide into two groups and the various officers would demonstrate the work in their own departments. In conjunction with the Institute, there was the Foot-and-mouth disease Research Committee's Experimental Station at Pirbright, ten miles distant. They could not show them that work, so Mr. Dobson, who was a research officer there, would have a few remarks to make about it, which, it was desired, should not be made public. Following the reading of a short letter by Mr. Dobson on the work being carried on at Pirbright, the party proceeded, in two sections, to visit the various indoor departments. In the small *Post-mortem* Room, demonstrations on anthrax, swine fever, rabies and sheep scab were made by Mr. Watt, and the carefully prepared comparative specimens of the normal and the diseased subjects were the objects of great interest. In the Abortion Laboratory, Mr. L. E. Perkins demonstrated on abortion work and showed some tuberculous guinea-pigs, while the scope of the poultry work undertaken was described by Mr. N. S. Barron, in the Poultry Diagnosis Room. The Tuberculosis Vaccine Laboratory, and the technique of manufacture, were the subjects of much appreciative comment, and a move was then made to the Helminthology Section, where keen attention was paid to the remarks of Mr. J. C. Taylor, concerning a

branch of study, the importance of which, to the practitioner is becoming increasingly recognised.

The tour of the main building (the Laboratory) concluded by the re-union of the two parties at tea in the Museum—a thoughtful feature of the programme which was particularly appreciated by those travellers who had had little or no opportunity of lunching. Much refreshed, the party proceeded to carry out the concluding part of the proceedings—one which was of quite exceptional interest to all—a visit to the outside buildings. The whole estate covers forty acres, and grouped around the centre block are many splendidly built and equipped units for the housing of large and small experimental aminals. Among the features which attracted the most attention were the experiments in progress concerning B.C.G. vaccination—the exposure of young infected bovines to "open" cases of tuberculosis, and the feeding of others on tuberculous milk; intradermal tuberculin testing, contagious abortion, and the treatment of parasites.

Throughout the interior and exterior tours, many members of the staff were available to answer questions and full use was made of this further opportunity for the acquisition of information.

When the time came—all too soon—for departure, the President expressed the great appreciation of the members for all that the staff of the Institute had done, and done so successfully, to make the visit of the Division an instructive and delightful one. They had all had a memorable day.

W. D. REES, *Hon. Secretary.*

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

September 1st to 7th—N.V.M.A. Congress at Newcastle-on-Tyne.

August 13th—Meeting of the Editorial Committee, N.V.M.A., 4-30 p.m.

August 23rd—Midland Counties Division Picnic to Colwall and Malvern.

THE NEWCASTLE CONGRESS.

We wish once again to remind members that the Local Secretary, Mr. J. R. Rider, "Ivycroft," Carmel Road, Darlington, is most anxious to complete his list of those who, with their ladies, will be attending the Civic Reception on September 4th. We may also reiterate the Provisional Committee's hope that single gentlemen will elect to stay at Easton Hall and will lose no time in booking accommodation there, for it will be of the best.

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As announced last week, it is hoped to arrange what would be a most interesting feature of the social programme in a whole-day excursion to the Roman Wall, on Tuesday, September 4th, or Wednesday, September 5th. Members who desire to take such an excursion should advise the Local Secretary without delay, at the same time stating any preference they may have for one of the dates mentioned.

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Fellows or Members desiring gowns for the Annual Meeting at Newcastle should apply to Messrs. Ede and Ravenscroft, 13 Chancery Lane, W.C.2, stating whether a Member's or a Fellow's gown is required, chest measurement and height. Particulars of cost will be supplied on application to Ede and Ravenscroft's, who are the official robe-makers to the Royal College. It is hoped that as many members of the Association as possible will wear academic dress at the appropriate Congress functions.

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Every member of the Association who has paid his or her subscription will now be in possession of a copy of the Congress Handbook for the year. Those who desire additional copies, and readers of the *Record* who may not belong to the "National," can secure Handbooks at a cost of 3s. 6d. each, on application to the General Secretary, N.V.M.A., 10 Gray's Inn Square, W.C.1.

EX-SPEAKER MARRIES VETERINARIAN'S DAUGHTER.

Mr. J. H. Whitley, Speaker of the House of Commons until a few weeks ago, was married in London, on August 2nd, to Miss Helen Clarke, an old friend of the family.

The bride is a daughter of Mr. and Mrs. J. A. Clarke, formerly of "The Maze" and "Stags Holt," March, Cambridgeshire, and now of Hunstanton and Fransham, Norfolk. She has been a friend of the Whitley family for more than 20 years. Mr. Clarke, who is a member of the veterinary profession, practised at March for many years. He is also a well-known landowner in Cambridgeshire and Norfolk; in the latter county he is Lord of the Manor of Fransham; he also has property in Yorkshire and in Lincolnshire.

The ceremony took place quietly at Chelsea Old Church, and was performed by the Rev. E. G. Gordon. Only the near relatives of Mr. Whitley and Miss Clarke were present.

Mrs. Whitley was in Russia during the war and through the Bolshevist revolution. Since then she has been an active worker in connection with the Women's Institutes and the Arts and Crafts movements, which have done so much for the revival of village life. These movements are part of the work of the National Council of Social Service, of which Mr. Whitley has been president for the last seven years.

The bride was attended by her sister, Mrs. E. Ogden, and was given away by her brother, Lieut.-Col. A. E. Clarke.

Mr. Percival Whitley acted as best man to his father.

Shortly after the ceremony, Mr. and Mrs. Whitley left for the country. It is understood that they will later go abroad on an extended tour, and that on their return they will take up their residence at 27 Ormonde Gate, Chelsea.

Mr. Whitley lost his first wife three years ago and has two sons and two daughters.

B.SC. (EDIN.) IN VETERINARY SCIENCE.

The under-mentioned students of the Royal (Dick) Veterinary College, Edinburgh, have been successful in the recent examinations leading to the Degree of B.Sc. (Edin.) in Veterinary Science:—

Physics.—A. M. Adamson, W. F. Barton, J. D. Harper, G. N. Sutherland.

Botany.—A. M. Adamson, W. F. Barton, J. D. Harper.

Embryology.—A. M. Adamson, W. F. Barton, J. D. Harper.

Chemistry—J. Omand.

Sanitary Science.—J. Anderson.

Bacteriology.—J. Anderson.

Physiology.—W. G. Robinson.

The following students have completed the course and have graduated B.Sc. (Vet. Sci.):—
CHRISTOPHER HARVEY, M.R.C.V.S.
AURELIO MALAGA, B.S. (Lima), M.R.C.V.S.

PERSONAL.

Appointments.—Mr. Gwilym O. Davies, M.R.C.V.S., B.V.Sc., D.V.H., has accepted the invitation of the Council of the University of Liverpool to be Lecturer in Veterinary Pathology at the University. He is consequently resigning his appointment with the Ministry of Agriculture and Fisheries, and will be leaving the Ministry's Cattle-testing Station at Pirbright, Woking, Surrey, where he has been in charge for the Foot-and-Mouth Disease Research Committee. Mr. Davies takes up his new appointment in October.

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The following appointments have been made by the Secretary of State for the Colonies during the month of July, 1928:—

Name.	*Appointment.*	*Colony.*
Mr. H. A. Hay-Barclay, M.R.C.V.S.	Veterinary Officer, Agric. Dept.	Kenya.
Mr. J. F. Timoney, M.R.C.V.S.	Govt. Veterinary Surgeon.	Straits Settlements.

Royal Institute of Public Health.

THE DUBLIN CONGRESS.

At the Dublin Congress of the Royal Institute of Public Health, to be held from August 14th-20th, inclusive, there will be a Section (iv) devoted to the consideration of the production and control of milk and food. Professor J. F. Craig and Dr. Gerald Leighton are the Presidents of the Section, and amongst the Vice-Presidents are the following veterinarians:—Lieut.-Col. J. W. Brittlebank, and Messrs. S. R. J. Cussen, F. J. Daly, James Dodd, P. F. Dolan, A. A. Donnelly, A. Douglas, J. F. Healy, Professor Frederick T. G. Hobday, Mr. P. J. Howard, Professor J. T. Share-Jones, Messrs. H. C. I. Kelly, James McAllan, E. McSwiney, J. H. Norris, J. J. O'Connor, A. F. O'Dea, Capt. J. P. Rice, and Professor George H. Wooldridge.

The Hon. Secretaries are Professor T. G. Browne, and Mr. William A. Davidson.

Following is the programme of the Section:—

Wednesday, 15th August, 2.30 *p.m.* Presidential Address:—"The Supervision of the Food Supply." By Dr. Gerald R. Leighton, Esq., O.B.E., D.Sc., M.D., Medical Officer (Foods) Scottish Board of Health.

Thursday, 16th August, 9.30 *a.m. to* 1 *p.m.* "Some Problems in Meat Inspection." By Professor J. T. Share-Jones, D.V.Sc., M.Sc., F.R.C.V.S., President, The Royal College of Veterinary Surgeons, London.

"Animal Parasites of the Domestic Animals of Importance in Public Heath." By Capt. J. P. Rice, M.R.C.V.S., B.Sc., Head of Animal Diseases Division, Ministry of Agriculture, Northern Ireland.

Thursday, 16th August, 2.30 *p.m. to* 4 *p.m.* "Grading of Milk." By J. McAllan, Esq., M.A., B.Sc., M.R.C.V.S., Chief Veterinary Inspector, City of Aberdeen.

"Some Economic Factors relating to a Pure Milk Supply." By C. Wentworth Elam, Esq., M.R.C.V.S., D.V.H., Lecturer on Hygienic Inspection and Production of Milk, University of Liverpool.

Friday, 17th August, 9.30 *a.m. to* 1.30 *p.m.* "MILK: Safeguards required to ensure its Freedom from Bovine Infection." By J. H. Norris, Esq., M.R.C.V.S., Director of Veterinary Research, Dept. of Lands and Agriculture, Irish Free State.

"Wholesome Milk." By Wilfred Buckley, Esq., C.B.E.

"The Science of Hygienic Production and Control of Milk." By A. J. Hosier, Esq., Director of Hosier Open Air Pure Milker, Ltd., Marlborough, Wilts.

"Butter and Margarine in Relation to Public Health." By Percy Noel Williams, Esq., M.Sc., F.I.C., and Kenneth MacLennan, Esq., M.C., B.Sc., Planters Foods, Ltd., Crombro Port, Cheshire.

DISCUSSION: "Milk as a Cause of Bovine Tuberculosis." To be opened by Sir Wm. I. de Courcy Wheeler, M.D., Wm. S. Haughton, Esq., M.D., and H. F. MacAuley, Esq., M.B.

R.C.V.S. LIBRARY.

The undermentioned books have recently been added to the Library:—"Blood and Urine Chemistry," Gradwohl, 1928; "A Textbook of Bio-chemistry," Cameron, 1928; "The Conduct of Medical Practice," *The Lancet,* 1927; "Reproduction in the Rabbit," Hammond and Marshall, 1925; Taylor's "Practice of Medicine," Poulton, 1925; "Manual of Surgery," Rose and Carless, 1927; Rovsing's "Abdominal Surgery," Clinical Lectures, 1914; Osler's "Principles and Practice of Medicine," McCrae, 1927; "Infected Wounds," Carell and Dehelly, 1918; "A Compendium of Food Microscopy," Clayton, 1909; "Pathological Technique," Mallory and Wright, 1924; and "Statistical Methods for Research Workers," Fisher, 1925.

Any book may be borrowed from the Library on payment of postage both ways. Applications should be made to the Librarian, Royal College of Veterinary Surgeons, 10 Red Lion Square, London, W.C.1.

COSTS OF THE TUBERCULOSIS ORDER.

At a recent meeting of the Essex Diseases of Animals' Sub-Committee, it was reported that during the quarter under the Tuberculosis Order, 211 cases had been notified and 187 confirmed. The amount paid in compensation was £992 1s. 7d., of which £744 12s. 9d. was refunded by the Ministry. £216 2s. 6d. was received from salvage, leaving the net cost to the county, £32 1s. 9d.

The Southampton County Council wrote with reference to the proportions in which the cost of carrying out the provisions of the Tuberculosis Order of 1925 were being borne by the Exchequer and by the local authority, and suggested that the Minister of Agriculture be urged to promote legislation with a view to securing a contribution of 75 per cent. towards the cost of the administration of the Order in addition to the contribution made in respect of compensation for slaughtered animals. It was stated that from Sept. 1st, 1925 to March 31st last, the total compensation paid in Essex was £12,125 13s. 9d., and the amount received from the Ministry, £9,094 5s. 3d., leaving £3,031 8s. 6d. to be paid by the county, plus £5,056 14s. 2d. veterinary fees, a total of £8,088 2s. 8d. £2,245 14s. 0d. had been received in salvage, making the net cost for the county £5,842 8s. 8d. The Chairman said the Order was for the benefit of the public health, and he thought the cost should be a national affair.

SLAUGHTER OF TUBERCULOUS COWS.

In the House of Commons, Mr. Buxton asked the Minister of Agriculture the number of cows affected by tuberculosis which had been slaughtered in 1926 and 1927 in pursuance of the Tuberculosis Order, 1925; and whether he was satisfied that the Order was fully operative. Mr. Guinness replied: The number of cows (including heifers) slaughtered under the provisions of the Tuberculosis Order, 1925, in 1926 and 1927, is 16,522 and 16,708 respectively. Local authorities have now completed their arrangements for carrying out the requirements of the Order, and I am satisfied that the Order is properly executed.

Mr. Buxton: Does the Minister not think that in view of the increase, an increase in the staff of inspectors is needed? Mr. Guinness: I do not think so; the local authorities seem to be carrying out their duties satisfactorily.

The Editor acknowledges the receipt of the following:—Communications from Professor T. G. Browne, Messrs. H. Gray, J. Howard Jones, Major H. Kirk, Captain A. W. Noel Pillers, Messrs. P. R. Turner and W. J. Young.